The MAC Flyer

NOVEMBER 1972

MILITARY AIRLIFT COMMAND
GEN PAUL K. CARLTON Commander
LT GEN JAY T. ROBBINS Vice Commander
BRIG GEN JOHN H. GERMERAAD Inspector General
COL N. C. FLYNN Chief, Safety Division

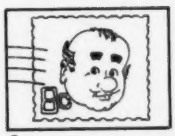
For Greater Efficiency
in MAC Air Operations

The MAC Flyer

THE STAFF
MAJ RICHARD L. WING Supervising Editor
MAJ ROBERT L. GARDNER Associate Editor
CAPT PHILLIP R. BUDD Associate Editor
MARILYN A. BOLIEAU Managing Editor
TSGT WAYNE L. MILLS Art Director

NOVEMBER 1972 MAC RP 127-5 VOL XIX, NO. 11

Those Man-Made Rocks in the Sky . . . 3
Complacency 7
Letters to the Editor 8
Why Induce Disaster? 10
Routine to the Unaware 12
Mishap with a Moral 14
Tom and the Birds that Didn't Fly . . . 16
Wake Island — Sea Level Air Base . . . 19
They Aren't Easy to Find 22
Global Notes 24
C. R. Terror 25
Quick Stoppers 28


8

12

16

COVER: Wake turbulence — a hazard to all who fly. Painting by Fred L. Groennert, MAC Graphics.

The MAC Flyer is published by the Safety Division, HQ MAC. The contents are informative and not regulatory or directive. All names in accident stories are fictitious and no information concerning aircraft accidents may be construed as incriminating under Article 31, UCMJ.
Contributions, comments, and criticisms are welcome. Write: The Editor, The MAC Flyer, MAC/IGYE, Scott AFB, IL 62225, or call: (618) 256-3534, Autovon 638-3534. The Editor reserves the right to change manuscripts to improve them or correct technical errors.
The magazine is available from: The Superintendent of Documents, Government Printing Office, Washington, DC 20402. Price: 20 cents per copy, $2.00 per year ($2.50 foreign).
Distribution F, X; OPR MAC/IGYE.

Squawk Box

Over the months we've read many editorials from base newspapers and safety magazines. And usually, the prime editorial objective seemed to be space filling — with slogany exhortation or pious platitudes.

Then we ran across the comments of one editorialist who's as honest a speaker as he is a square-shooting commander. Consider these remarks by Col George M. Wentsch from the McGuire *Airtides*, Sep 1, 1972.

"I want to discuss loyalty, which is an absolute necessity to an organization but must be a two-way street. I realize a commander cannot expect to receive loyalty and support unless each and everyone realizes that he has the commander's complete support and backing. I urge each supervisor to keep in mind that the loyalty of a subordinate must be earned.

"I will expect complete candor and honesty on the part of all members of this wing. I urge everyone to be completely honest with himself and with others. An organization cannot exist with less. For example, I certainly hope I never hear anyone say, 'I hope the old man never finds out about that.' That man is afraid to admit a mistake and is not being honest with himself."

* * *

He hit some telling blows, and left us with terse questions. As individuals, do we show the boss the "candor and honesty" he wants — and needs? As bosses, do we encourage and accept this openness? In most cases, our answers would be *no*. As subordinates, we don't want to rile the old man. As supervisors, we don't really want to hear the things that might cut our ego or impugn our leadership abilities. So we pull a Pollyanna, cant the news, play CYA instead of "To Tell the Truth."

Like those editorials, we become space fillers. Our slogan: "I believe in honesty, *but* . . ."

Heavy jet wake turbulence is a growing problem. Smart pilots know what causes it, where to find it, and how to avoid . . .

Those Man-Made Rocks in the Sky

by Capt Phil Budd

"YOU'RE CLEARED TO LAND. Caution — possible wake turbulence from departing heavy jet." Radio transmissions like this are common at any airport which handles heavy jets — aircraft with gross weights of 300,000 pounds or more. The pilot of a DC-9 heard a very similar message as he was on short final behind a departing DC-10, and it was the last transmission he heard, for moments later his aircraft was a ball of flames. According to the investigators, a likely cause of this recent crash was wake or vortex turbulence.

Our C-9 pilots have reported some hairy encounters with vortex turbulence while operating into some civil fields, and all of our aircraft are susceptible. As more and more of the heavy jets—C-5, B747, DC-10, L-1011—become operational, the problem will increase. Incidentally, FAA previously published separation criteria for most aircraft following heavy jets but had never addressed the heavy jet behind heavy jet problem. However, several of the big boys found themselves in severe turbulence behind DC-10s or L-1011s, and the controllers now have extra rules telling them to allow special spacing for *everyone* following a biggie.

We won't belabor the point that wake turbulence is dangerous, but we will give you some tips on how to avoid it. For those of you who want a detailed discussion of how wake turbulence is formed, we recommend that you read "FAA Advisory Circular 90-23B," 17 May 1971, *Flight Safety Facts and Analysis*, Sep 1971 or July 1972, or the Sep 1971 issue of THE MAC FLYER. For discussion we'll look at vortex characteristics, operational

problem areas, and vortex avoidance techniques. No matter what you fly, teeny-weenies or jumbo jets, you can apply these simple avoidance techniques.

Vortex Characteristics

Every airplane generates two vortexes. They begin when your nose wheel breaks ground and end when you

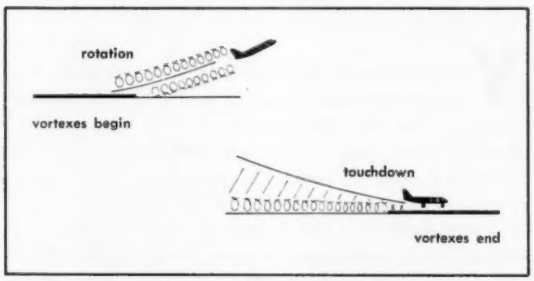


Figure 1. Vortex generation

put the nose wheel back on the ground during landing roll (figure 1). Each vortex forms at the wingtip as air circulates outward, upward, and around the wingtip (figure 2). The diameter of the vortex core varies

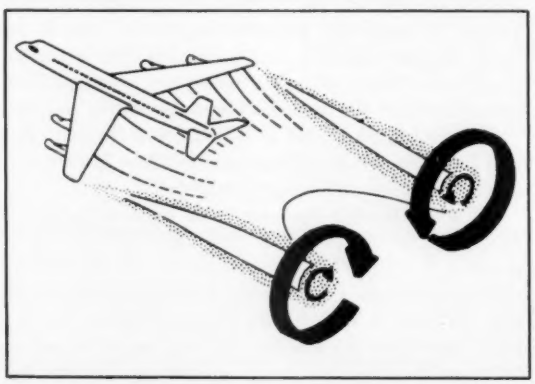


Figure 2. The rolling-up process

with the size and weight of the aircraft. Tests with heavy aircraft have shown that the vortex core can be 25 to 50 feet in diameter and that the area of dangerous turbulence can be much greater. The vortexes stay fairly close together, about 3/4 of the wing span, until dissipation (figure 3).

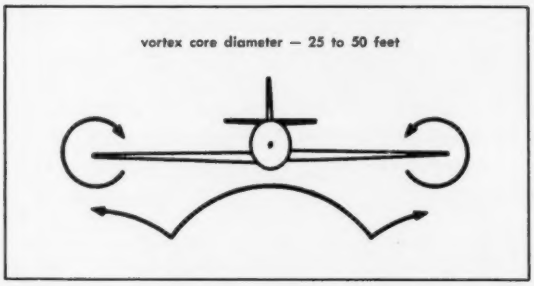


Figure 3. Vortex core spread

Other tests have shown that after the vortexes are formed they start to sink at about 500 feet per minute and stabilize about 900 feet below the flight path, where they begin to dissipate (figure 4). The vortex strength diminishes with time and distance behind the generating aircraft; atmospheric turbulence also enhances dissipation. Even after breakup, though, a residual choppiness usually remains.

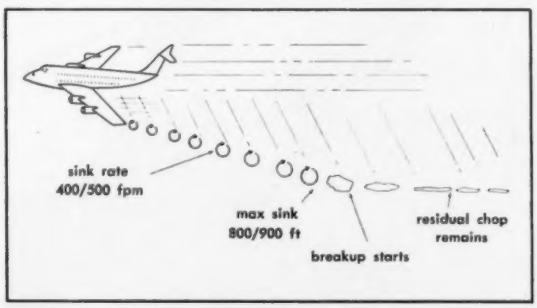


Figure 4. Vortex zone

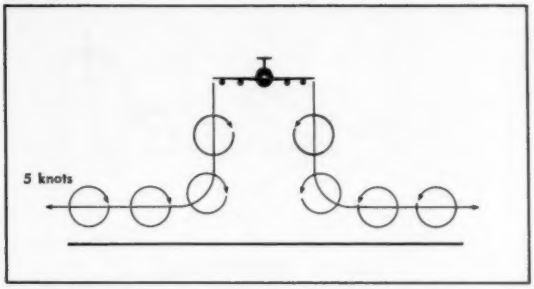


Figure 5. Vortex movement in ground effect — no wind

While a turbulence encounter at 20,000 feet can be disconcerting, one at 50 feet can be disastrous. Low level vortexes not only behave differently but they catch you in a low maneuverability corner.

Ground effect and surface winds alter the vortex characteristics slightly. As the vortex sinks into the ground effect zone, it begins moving laterally at about five knots (figure 5). A crosswind will decrease the lateral movement of the upwind vortex and increase the movement of the downwind vortex (figure 6). This could

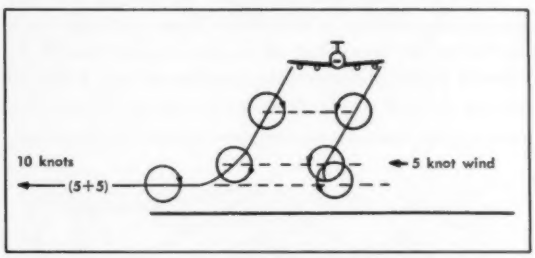


Figure 6. Vortex movement in ground effect with crosswind

hold the upwind vortex over the runway and allow the downwind vortex to drift over a parallel runway. Tailwinds can also move the vortexes of a preceding aircraft forward into the touchdown zone of your aircraft (figure 7). As you can see, these vortexes have very definite

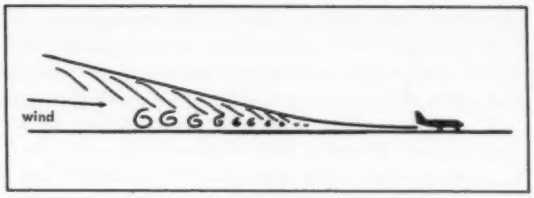


Figure 7. Tail wind movement of vortex

characteristics and can easily be visualized. Having a mental picture of their location will help you avoid them.

Operational Problems

Every vortex is not going to be a hazard. A lot depends on your size and position in relation to the size of the aircraft creating the wake. The size and intensity of the vortex are directly related to the weight of the aircraft and inversely related to the air speed. In other words, the heavier and slower the bird, the rougher the vortex. Also, an airplane in a clean configuration leaves a much rougher wake than a dirty bird.

As we mentioned earlier, time and distance are minimizers. Therefore, you may only encounter a couple of bumps as you cross the vortexes, or you may hit turbulence severe enough to cause loss of control or structural damage, or give you one hell of a scare.

Another variable is the direction you are flying and the distance you are from the generating aircraft. Chances of increased buffeting and induced roll are greatest when your heading is aligned with that of the generating aircraft. And obviously the closer you get to the ground the more dangerous the effects become because you may not have enough altitude to recover. A rule of thumb: trouble lurks behind and below larger aircraft.

Vortex Avoidance

Now for the meat of the message — vortex avoidance. Visualizing the vortex location and using proper avoid-

ance techniques will help achieve efficient operation for both IFR and VFR traffic. These techniques that we'll discuss are above and beyond mandatory procedures that radar and tower controllers use in providing you with separation. For example, if you're landing on the same runway, behind a large airplane, stay at or above its final approach flight path. Note his touchdown point and then land beyond it (figure 8). If you're landing

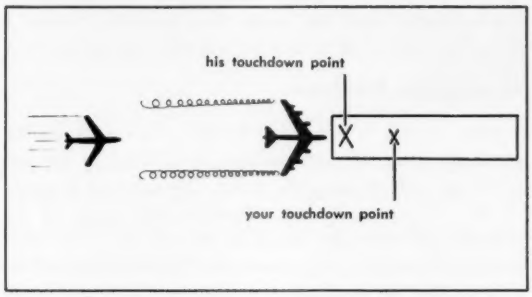


Figure 8. Planned touchdown technique

behind a heavy aircraft with less than 2,500 feet of lateral separation, note the wind for possible vortex drift and request to land on the upwind runway. Then stay at or above the other aircraft's final approach path — note his touchdown point — and land beyond a point abeam of his touchdown point (figure 9).

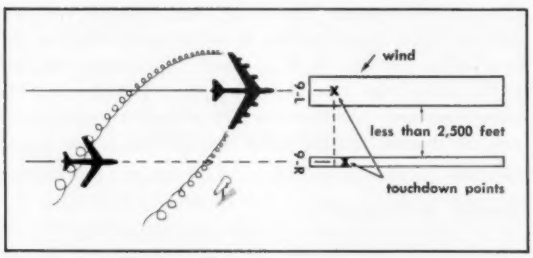


Figure 9. Parallel runway technique

Similar techniques may be used when departing behind a larger airplane. Just note the aircraft's rotation point and then start your rotation before this point (figure 10). Then keep your climbout path above the heavier bird's climbout path, avoiding any headings which cross below and behind the other aircraft (figure 11).

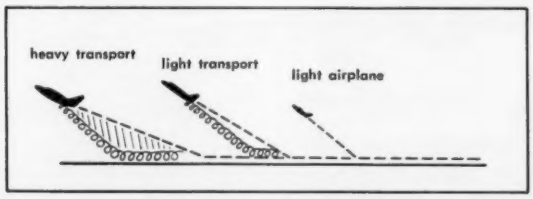


Figure 10. Departure technique

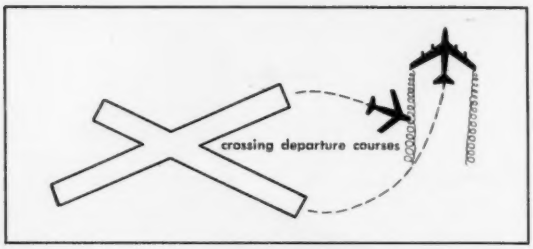


Figure 11. Climbout technique

Also during calm wind conditions, be particularly alert for vortexes that may:

- Remain in the touchdown area.
- Drift to a parallel runway.
- Sink into the takeoff or landing path of a crossing runway.
- Sink into the traffic pattern for another airport.
- Sink into the flight path of a VFR flight operating 500 feet lower.

Helicopters

Large airplanes aren't your only menace. A hovering helicopter generates a downwash from its main rotor similar to the prop blast of a conventional aircraft. In forward flight, this energy is transformed into a pair of trailing vortexes similar to wingtip vortexes (figure 12).

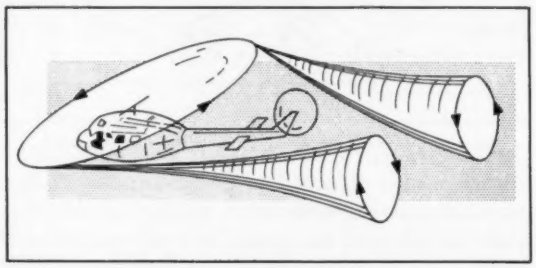


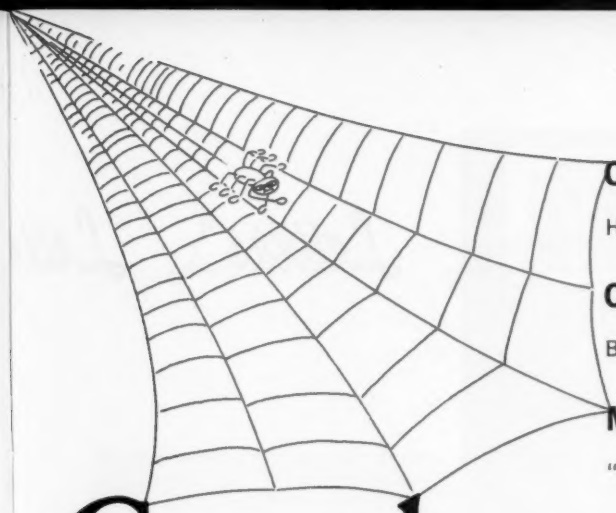
Figure 12. Helicopter vortexes

Either the downdraft or vortexes can ruin a light airplane. Mission support drivers, light airplane buffs, and other helicopter pilots should stay clear of hovering (or moving) helicopters, especially the heavy lift models.

Summary

There were vortexes behind the wingtips of the Wright Flyer when it lifted off the sands of Kittyhawk. They are behind the wingtips of our airplanes today.

We know that wake turbulence is dangerous, and we know that the best way to survive it is to avoid it. Mentally picturing where the vortexes of a preceding airplane are and applying these avoidance techniques will go a long way in helping you stay away from these man-made rocks in the sky.



Compla-cency

C is the Copilot, wond'rously bright,
Who no longer studies his Dash One at night
He never would say he's complacent, and yet
His memory isn't as good as he'd bet.

O is the Ornery Old Man in Ops;
For on-time departures he'll pull all the stops,
But ask him if he is complacent and see
If he doesn't roar: "Maybe you are. Not me!"

M is the troop with the Maintenance crew
Who knows even more than a plane builder knew.
"Use work cards? Not me — I'm as sharp as a tack.
"Whatcha mean that's my airplane that's taxiing back?"

P is the Pilot, so brave and so bold,
So skilled in his trade that he cannot be told
That he is complacent. But watch him with fear —
He's making the same mistakes, year after year.

L is the Loadmaster, lively and quick;
When tying down cargo he knows every trick.
"I'm never complacent," he'll state from his nook,
But it's been seven years since he looked in the book.

A is the guy dressed in white from Alert,
His fingernails always as clean as his shirt.
"No sweat — we can service it. Leave it to me,
"I learned all about those in late fifty-three."

C's the Command Post. Now, they're on the ball.
They shuffle the aircrews like they know it all.
They think that complacency only applies
To the guy out in front, with an airplane, who flies.

E is the Engineer, planning the cruise,
Who knows without charts quite the best height to choose.
"I'm never complacent — that's wisdom, you see,
"And you'll know as much when you're gray-haired like me."

N is the Nav with his maps and strange gear.
To him, thirty miles is sufficiently near.
Complacency's never a thorn for this ace —
Till he busts an ADIZ. See egg on his face?

C is the Crew, hard at work in their bird.
"We're standardized, man; every action and word."
Complacency is a disease they'll deny —
"Who, me? Not a chance. Maybe some other guy . . ."

Y is for YOU — **and** for us and for me.
We know what complacency really can be.
But still we postpone and procrastinate too.
Could we be complacent? I don't know. Do you?

With thanks to Col Stanley F. H. Newman, Oklahoma ANG

Letters Letters

Looks like you, our readers, are not only alive and well but are willing to sound off about what's going on in your friendly flysafe magazine. Here are more of your letters.

* * *

Dear TMF Editor:

Please sir, you jest! Your June 1972 "C. R. Terror" implies that ACGS risked resources and had an accident.

Please advise your readers that ACGS has flown 113,000 hours in 12 consecutive years without an accident while operating in remote areas of the world, often under bare base conditions.

Believe it or not, many fliers believe that C. R. Terror is real. Real or imagined, he (fortunately) has never been assigned to ACGS.

Lt Col Octavio Jordan
ACGS/OI

★ C. R. Terror has the unique ability to fly any aircraft in any of MAC's subcommands. In fact, at least one of C. R.'s authors spent a tour in photo-mapping gathering facts which later became the basis of several bits of C. R. fiction. True, we do jest; in the hope of preventing accidents, we use a spoonful of humor to help the message go down.

* * *

Dear TMF Editor:

Reference your May article "Fuel Tank Fiasco" and "Oxygen or Air" in the "After Deadline" section of your August issue.

On that particular day, I was assistant NCOIC of the crew involved. I had just returned from supper when all this was in progress.

The fire department brought a blower but refrained from using it because of insufficient hose to reach the tank. Instead, they used a low pressure air compressor (MC-1) and inserted the hose into the #3 main tank fuel filler neck. The airman who was in the tank had his face directly beneath the opening and could be seen with a flashlight. The air was blown directly on his face. How much good was actually done is hard to determine, but at the time it was the only thing available and it did keep some of the fumes away from him. He was completely "drunk" on the fumes by that time anyway.

It was really a fiasco, almost deadly.

(name withheld)

★ We salute you in your willingness to share with our readers what must be an embarrassing experience. How many hundreds of MAC accidents could have been prevented if others were as honest as you?

* * *

Dear TMF Editor:

(Reference "Married Men are the Safest Crewmembers," July 1972)

I find your *Undoubtly throughly Married view* imposed on you by your freeloading wife. Swinger Indeed all marrieds view the life the single as just that. You have tax advantages and a sure cuddle every now and then.

Then you come up green with envy over the single's ability to manage his finances without the inroads of the sick temper tanturums of a unsophistocated woman.

With the world rapidly running out of resources you insist on procreating like some sort animal. You dont realize that those children that you say you love will be the ones to suffer in that world of shortage, so you blame us singles for all your fears.

Why dont you do something about that stupid and unthinking circle of social emguagements that you find nessary to refelect your poor Immage of security. Stop buying all that finery and pay off your debts get that IBM stock that you want, convince your spouse that stock or investment would be better for your future than that new formal for the duputy commanders party. Every advantage you have as an officer is ereased by this form of tax action.

This also leads to bad feeling between you and people you have not even met; and makes you old before your time.

"To sum it all up either satisfi yourself or GET A DIVORCE."

(name withheld)

★ No one could accuse you of failing to state your position. Enjoy your singleness to the fullest.

* * *

Dear TMF Editor:

Colonel Petrak's lead article in the May issue, while trying to defend AF regulation of aero clubs, has neatly sidestepped the most restrictive regulation of them all. Most of us realize that currency rules and restrictions are designed to *save our necks*. However, not being able to carry passengers, after so being certified by the FAA, has no bearing on flight safety at all. Passenger restrictions were one of the underlying causes of C. R. Terror's misadventures further on in the issue. Would he have crashed had

tters Letters Letters Letters Letters Le

he been flying that old familiar aero club 150 instead of the 195 he somehow talked an unscrupulous FBO into renting him? Would he have crashed if AFM 215-8 allowed him to take up his girl friend, instead of forcing him to look elsewhere for a plane he could take her for a ride in? NO! (I am far from exonerating CRT, either; for starters, he rented an aircraft without a checkout and did not meet minimum FAA pilot experience requirements to carry passengers.)

"The perfect aero club must be able to meet the needs of all its members. It must have something for everyone from the zero time student pilot to the 10,000 hour professional, and for any experience level between these extremes." Today's aero club has little to offer its largest potential membership segment, the private pilot! As a result, the majority either resign shortly after they get their license or cheat on the rules. Both of the two clubs I have been in, Loring and Keesler, have had similar problems. Both have been on the verge of death. Both are primarily composed of students and instructors. Both have had a rash of private pilot resignations. Both have generated considerable business for their local general aviation FBO. The average pilot would rather pay more for poorer aircraft and fly less often just for the privilege of carrying passengers. Why go to all the bother of getting a license at all? A student can fly solo cross country just as legally as a private pilot can.

I like to fly! I don't mind the endless red tape, the number of CYA signatures one must obtain, or driving four miles from the hangar to Base Ops and back just to get the keys, but I dread the prospect of spending the next sixty hours in a three-quarter empty four seater. It is high time Air Force reexamines its policy. Or is its "true," though unstated, policy to kill all aero clubs? If so, USAF has made a great start; they already are on the endangered species list.

Roger W. Helbig
Concerned Aero Club
Member

★ Our aero club expert replies:

The carrying of passengers in aero club aircraft has been a controversial subject for years. In an effort to satisfy the many requests of aero club members to further lift restrictions on carrying passengers (some have been lifted over the past few years), on 1 March 1972, we officially queried Air Force on this matter. The subject is currently under study at Air Force level.

As a matter of interest, the MAC aero club program is growing. More members are flying better aircraft with better management than ever before. MAC clubs have increased membership by some 15 percent in the past two years, flying has increased by some 3,000 hours from 1970-1971, and we have flown almost 16,000 hours the first half of CY 72. More important, MAC clubs flew the entire CY 71 without accident or incident.

Hugh F. Redden
Director
Personnel Services

* * *

Dear TMF Editor:

Just received September The MAC Flyer (I subscribe).

- Full cover (front and rear) of miscellaneous photos — Excellent. Far superior to the cartoon (ugh) "Analyzer." Hope the "Analyzer" is a no-more.
- Major Tate's "Drifter's Reef"— what memories that brought back. Fine stuff.
- "Ramp Roulette" — Very fine.

Haven't read the whole mag as yet but — as above — right smart start.

Lt Col Doug Young
(USAF Ret)
Ex C-124 and C-141 AC
Charleston

★ Thanks — we needed that. Anyone else anti-"Analyzer"? And you suggest a good point: a personal subscription means a copy for sure every month. See coupon on page 29.

Induction icing can cause loss of thrust and engine failures. But in most cases it can be prevented. So . . .

Why Induce Disaster?

COLD WEATHER IS HERE AGAIN, and with it old man winter brings ice, snow, low ceilings, and subzero temperatures. He also declares open season for engine inlet icing. While this type of icing can occur virtually any time of the year, it is most common during the winter months when low temperatures and moist air team up. This menace to air operations leads to unexpected power loss, which is a very definite flight hazard. Recip drivers have long known about engine inlet icing, though they call it carburetor icing. Like their prop brothers, jet jocks must understand this induction phenomenon because both types of engines are susceptible and neither can operate with a seriously reduced air supply. And, unlike mechanical failures, over which the pilot has little control, engine icing can be avoided.

Conditions

Whenever you fly through classic icing conditions most everything on the outside of your aircraft will pick up ice. Flight through clouds which contain supercooled water droplets produces engine inlet icing similar to wing and windshield icing. Inlet cowls, ducts, struts, and compressor guide vanes can accumulate ice quickly in such conditions.

However, inlet icing can also occur in clear skies and above-freezing temperatures. Here's how: As air is pulled through the inlet duct its velocity increases, which reduces the pressure and causes a drop in the temperature of the entering air. If the humidity is high, moisture in the air condenses to form water droplets which become supercooled as they pass through the engine inlet. These droplets then freeze on contact with front stage compressor blades and guide vanes. (Engine ice detection systems may not indicate ice formation under these conditions.) Since the greatest temperature drop occurs at high rpm settings when the airplane is moving slowly, this phenomenon is likely to be experienced during ground operation, takeoff, and climb. The temperature drop becomes less as engine rpm is decreased after takeoff, and when the airspeed increases to the point that the air is rammed — instead of sucked — into the intake system very little cooling occurs.

The same circumstance takes place when flying or taxiing in visible moisture with temperatures slightly above freezing. A good example is the frequent engine icing which occurs during ground operation in fog. While this is to be expected, the insidious nature of engine icing often catches aircrews by surprise, especially when there's not much visible moisture.

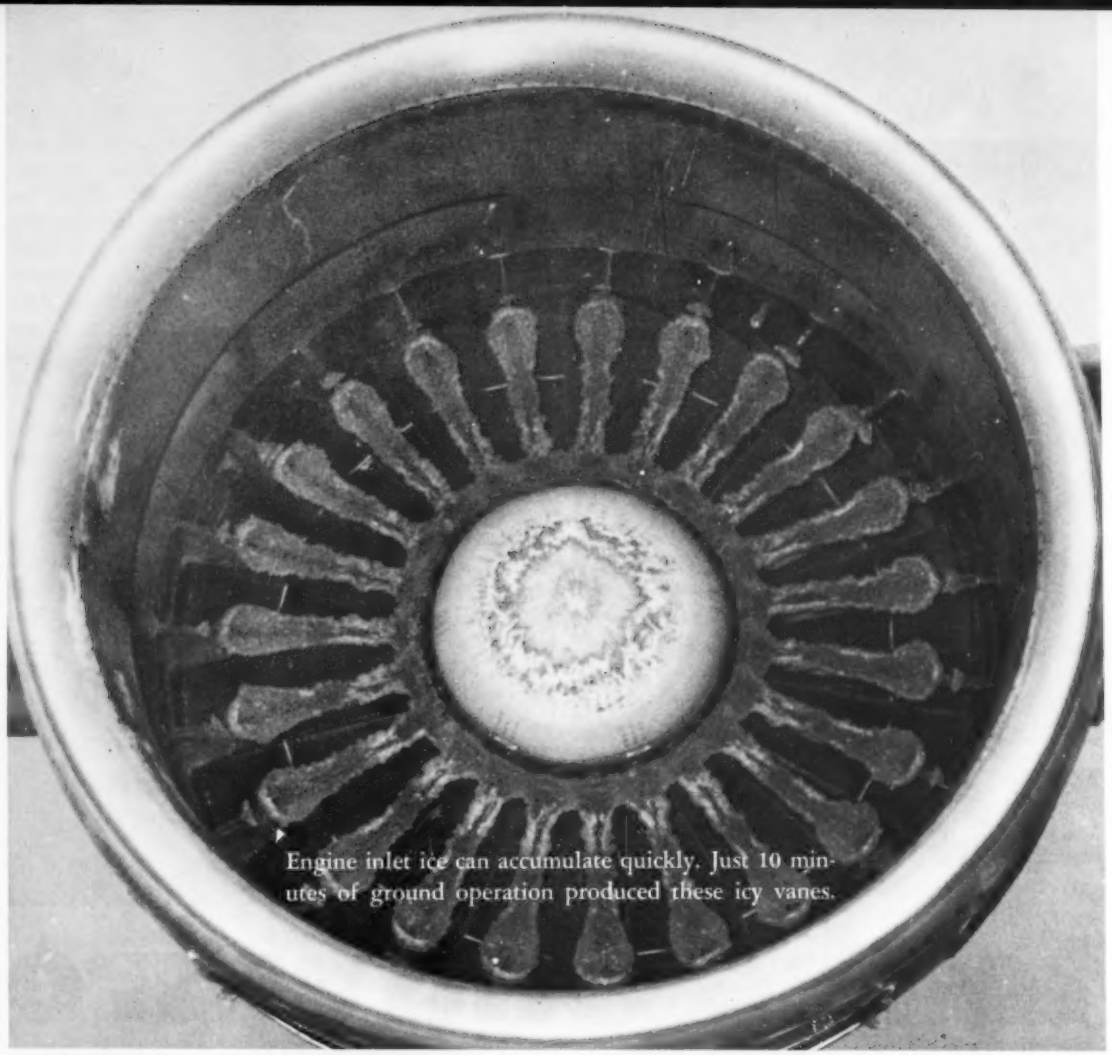
Here's an example: Not long ago an air carrier reported approximately a half-inch of ice accumulated on the inlet guide vanes during extended ground idle operation. The weather was clear and temperature —4 degrees C; however, the taxiways had been chemically treated to melt a covering of snow and ice. A very thin layer of fog, not more than one foot thick, had formed close to the surface. Although not considered as visible moisture, this saturated air was drawn into the intakes and caused the ice buildup.

Jet engine icing is somewhat unpredictable and cannot always be accurately forecast, but a close watch of the outside air temperature (OAT) gage should keep you out of trouble. Engine icing should be expected whenever the OAT is between —10 and +8 degrees C and visible moisture is present or the dew point is within 4 degrees C of the OAT. Also, engine icing may occur in clear weather when the OAT is 0 to +5 degrees C and the dew point is within 4 degrees of the OAT.

Hazards

We know why and how engine icing happens, but how does it affect aircraft performance? Here's how: Ice forms on fixed inlet screens and compressor inlet guide vanes and restricts the inlet airflow. This results in a loss of thrust if the condition is sufficiently severe. And thrust is what we need to fly our air machine. Once inlet ice starts to form, it can build up quite rapidly and has been known to block air passages between the inlet guide vanes in four minutes or less. Usually one of the first indications of ice is a rise in EGT followed by a compressor stall. Large buildups can cause an engine flameout.

Probably the greatest hazard of inlet icing is the potential danger of the ice breaking off and being ingested by the engine. High power settings on takeoff can free ice formed during ground operation at a critical phase



Engine inlet ice can accumulate quickly. Just 10 minutes of ground operation produced these icy vanes.

of flight. It doesn't take much ice to damage fan blades, inlet guide vanes, and compressor blades, and this almost always results in compressor stalls. Either mechanical damage or airflow reduction may lead to engine failure or forced shutdown.

Prevention

Today's jet engines are equipped with anti-icing systems to prevent the accumulation of induction ice. Hot air is bled from the compressor section and directed through the front inlet struts, guide vanes, and engine cowl lips. These systems are designed to function as anti-icing, not deicing, devices. This means they should be put into use *before* icing begins. After the ice has formed, it will be difficult to remove, and you run the risk of serious engine damage if it breaks free. Since anti-icing systems vary for different engines and aircraft, check your Dash One for the correct operating procedures. The good book may also prescribe high power settings or periodic engine accelerations along with other techniques for countering various icing conditions.

Conclusion

We recognize that the most proficient weather men cannot always predict just when and where icing may be encountered; however, by careful flight planning and proper use of anti-icing systems, engine icing problems can be prevented. Know the limitations and the icing control procedures for your aircraft, and avoid atmospheric icing conditions if at all possible. Keep in mind the tricky nature of induction icing, and turn on the anti-icing system whenever there is the slightest indication or suspicion that inlet-icing conditions may exist. Don't wait for ice to form.

By being aware of the conditions that cause engine ice and by applying the proper procedures to prevent its accumulation, engine icing can be pretty well eliminated as a hazard to our world-wide operations.

From Albatross to Choctaw: The 304th ARRSq makes a difficult transition safely and smoothly.

Routine to the Unaware

by George M. Myers
Western Air Force Reserve Region

IN TODAY'S EVER-CHANGING Air Force, units frequently find themselves transitioning from one type of aircraft to another. This in itself presents a challenge, but when an Air Force Reserve unit retires its HU-16 fixed-wing amphibians and reequips with HH-34 helicopters the challenge is a doubly demanding one. Here is an account of one unit's experience with this conversion.

* * *

The 304th ARRSq, of Portland, Oregon, recently accomplished a seemingly routine mission. Routine to the unaware, that is! To the men and women of the squadron who did it, their families who shared it, and their associates who knew about it, it was somewhat more than that. The mission was a cross-country training flight and an exercise in mobility. Eight helicopters left Portland, Oregon, flew to Hamilton AFB, California, and returned. But this is beginning at the *end;* let's go back to the real beginning.

The mission really began in April 1971 when the newly assigned commander published a combination accident prevention and aircraft transition policy letter. In it he offered these thoughts:

"It's easy to say, I'm for safety. What isn't easy is to prove it, and make it a part of our everyday functional activities.

"In the near future we will be flying a new piece of machinery. An active, alert, knowledgeable crewmember, crew chief, or specialist will have no trouble with the transition."

Troubles were minimal but the ef-

fort to complete the transition smoothly was taxing. Activities such as OJT, TTU, correspondence courses, and supply restocking became a full-time way of life. The managers and supervisors, though perhaps not "peaked out," were extended. Not only did everyone have to be retrained; through it all had to run the continuous thread of safety. The commander planned carefully, the supervisors managed efficiently, and the specialists learned and performed their tasks thoroughly. And yet, all the while, a spirit of can do and will do prevailed. Each day the sense of accomplishment was great, and only four months after receipt of the last UE aircraft, the squadron attained a C-3 combat readiness status. That was eight months ahead of schedule! And the following month, ARRS Headquarters IG rated the unit "Excellent."

The conversion of this and other squadrons from fixed to rotary wing had created some command problems in the areas of standardization, supply, and logistics. Introduction of the HH-34 was completely new to the Air Force and Reserve inventory. Probably the major problem was the lack of specific information on the reliability of the HH-34 Choctaw helicopter and requirements for its logistic support. To clarify some of the problem areas and acquire first-hand information about the reliability and capability of the system, an exercise plan was developed based on the mission requirements of MAC Manual 51-34.

A cross-country training flight, involving low level navigation, diversion from flight plan, and logistic support, was chosen as the basic activity. An operations order was developed which laid on the mission for the flight crews, support from maintenance and supply, and coordination with higher headquarters, other U.S. Air Force activities, and FAA.

The HH-34s requirement for 115/145 aviation fuel presented a logistics problem. The helicopter has an operating range of three hours at 85 knots, so en route refueling would be necessary. However, the only 115/145 fuel available on course in Oregon was at Portland International Airport, so the plan called for squadron personnel to position a fuel truck with 3,000 gallons of 115/145, and a 1-1/2 ton truck with specialists and mobility equipment such as an APU and spare parts at Medford, Oregon.

A major decision was made to use all eight of the unit's assigned UE aircraft. For emergency assistance, two extra support HH-34s would be placed on alert status at Portland. The eight mission aircraft would depart Portland International Airport, fly VFR in trail to Medford for refueling, then proceed toward Hamilton AFB with a preplanned diversion to Beale AFB, California. The return flight was an exact reversal of the plan.

How did it work out? As mentioned earlier, "The 304th ARRSq . . . accomplished a seemingly routine mission . . ." The proof can be found in this simple statistical summary:

8 Aircraft (as planned)
51 Personnel (as planned)
3 Days (as planned)
50 Sorties (flown exactly as scheduled)
97.4 Hours Flown (as planned)
3 Aircraft Discrepancies:
Inverter Light (changed)
Garlock Seal (changed)
ASE Role Mode Out (repaired)
Mobility Plan (completed)
Capability of HH-34 in Operational Environment (confirmed)

* * *

The 304th ARRSq demonstrated that safety in any operation starts far before the ops plan is written, continues through its everyday activities, and becomes a statistical part of its history through total individual awareness of its existence. To the personnel of the 304th, accident-free performance and operational capability are evidence that foresight, planning, and hard work pay off. Their success in this mission looks routine only to the unaware.

TURNAROUND FORMATION: This line-up of HH-34s at Hamilton AFB signals the halfway point in the mission.

Confusion, overly quick reactions, and maldiagnosis of problems produced . . .

Mishap with a Moral:

Spring loaded for a Disaster

YOU ARE ABOUT TO READ three condensed accident briefs. Each of the accidents occurred during a takeoff or a missed approach — a critical phase of flight. What happened to these pilots could happen to any pilot, multi-motor or single engine.

Case Number One

A B737 lifted off the runway and climbed to about 50 feet with the first pilot flying the aircraft from the right seat. As the gear came up, a loud explosion shook the airplane and crew. Immediately the captain took the controls as the twin-engine jet yawed to the right. He shoved both throttles forward and noticed the right engine spooling down. As the first pilot asked if the captain had the airplane, he thought he saw the left engine spooling down. The captain did not feel or hear any response from the increase in power, so he assumed that both engines had failed. Neither pilot confirmed with each other what they saw.

Since a portion of the runway was still visible below, the captain chose to abort the takeoff and land back on the runway. He yelled for the gear and then touched the '737 down with slightly more than 1,000 feet of runway remaining and continued through a field and a chain-link fence, finally coming to rest about 1,600 feet from the end of the runway. The elapsed time from the loud explosion to the touchdown was 12.7 seconds.

The investigating board found no evidence of in-flight structural failure, malfunctioning of the flight control system, or failure of the right engine. They did find that the *left* engine had failed at about 50 feet, and that with power from the right engine the crew could have safely continued to climb and made a single engine approach and landing. The crew reacted in direct conflict with their previous training and with the company's procedures to continue the takeoff.

The accident board concluded that the cause factors in this accident were the operational procedures used by the crew.

Case Number Two

A DC-9 was making a practice missed approach from a GCA. The pilot in the left seat was receiving a check ride from the check pilot in the right seat. The aircraft was about 200 feet above the runway when ground observers heard a loud explosion and saw pieces falling from the airplane. The aircraft continued its climb to about 400 feet where it leveled off and appeared to lose all power. From this point the DC-9 started a gradual descent and crashed. The total time from the engine failure to the crash was 38 seconds.

Investigators found that the right engine had failed during the missed approach and that the left engine, which was capable of producing full power, had been shut down. They also determined that an electrical system failure caused the right engine instruments to fail in a position showing a power output.

Although the point was not proved, the investigating board felt that the check pilot probably took control of the aircraft and reduced power on the left engine in an attempt to reduce severe airframe vibration. The vibration lessened, and the right engine instruments appeared to indicate that the right engine was producing power. Assuming that the left engine was the one that failed, he shut it down.

The investigating board concluded that the pilots mis-

identified the failed engine and shut down the good engine.

Case Number Three

The BAC-111 crew was unusual: it consisted of three captains. One was a line check pilot who was designated "aircraft commander." He sat in the jump seat and supervised the captain in the right seat, who was the "copilot." Another captain was in the left seat and was designated "pilot-in-charge." All three pilots were qualified in the airplane; however, the captain-copilot had only limited experience in the BAC-111.

The crew had completed several legs of their flight plan and had incurred a diversion and a delay. They finally got the aircraft loaded, taxied it out, and were cleared for takeoff. As the pilot-in-charge rotated the aircraft to the takeoff attitude, the crew heard a distinct "bang" which sounded like someone had kicked the side of the fuselage with a heavy boot. The pilots immediately associated the noise with the engines and after a glance at the engine instruments, the aircraft commander (the line check pilot in the jump seat) said, "I think it's number one." After a brief pause he said, "Close the throttle."

The pilot-in-charge (the captain in the left seat) immediately closed the throttle for number one engine. The copilot, hearing the aircraft commander's comments, began looking in his checklist for the engine failure emergency procedure. He then became aware of the aircraft's decreased acceleration with number one throttle off. He saw that the gear was still down and immediately retracted it. This did not improve the performance. At this time, the altitude was approximately 250 feet and from here the airspeed and altitude decayed. Realizing that a crash landing was inevitable, the pilot-in-charge made a smooth touchdown in level terrain off the end of the runway. Total flight time was 88 seconds.

Investigators found that number one engine — the one shut down — was in perfect condition and that, on number two engine, a segment of the high-pressure turbine seal had become detached and had fouled the turbine blades. This malfunction would have caused a surge in the low pressure compressor which could have been clearly heard as a "dull explosion." This surge would have been very brief and any decrease in thrust would have been restored to at least 97 percent of the original power within one-tenth of a second. Other than this minor defect, there was no damage to number two engine until impact.

Also, the investigators determined that number two engine was operating at about 86 percent at impact. This may have been the result of a precautionary pull back of both of the throttles by a crewmember, or number two throttle may inadvertently have been moved when number one was closed. None of the crewmembers remembers moving number two throttle. With number two operating at reduced power and number one shut down, the aircraft could not sustain flight. The cause factor in this accident was operator error.

* * *

Although we have simplified these accident briefs, there were many factors that combined to lead these pilots to take the wrong corrective actions. In two cases there was a mid-emergency change of aircraft control. When the B737 copilot relinquished control of the aircraft to the captain, the captain might have misinterpreted the right yaw, resulting from the copilot's release of rudder pressure, to be the same yaw associated with a right engine failure, thereby misidentifying the failed engine. In the case of the DC-9, the electrical failure plus severe airframe vibration from the failed engine and the possibility that the pilots changed control of the aircraft surely combined to help them misidentify the failed engine. Finally in the BAC-111 accident, crew fatigue plus a confusing chain of command surely left some doubt as to who was running the show and probably triggered the crew's incorrect response. *In every case, though, the crews reacted super-fast — and incorrectly — to an emergency during a critical phase of flight.*

* * *

Three accidents — all needless — and all reaffirming that undue haste is expensive. These three aircrews took extremely rapid actions to correct an apparently serious problem—and their reactions led directly to the crashes. Initially, each crew would have been better to have done nothing.

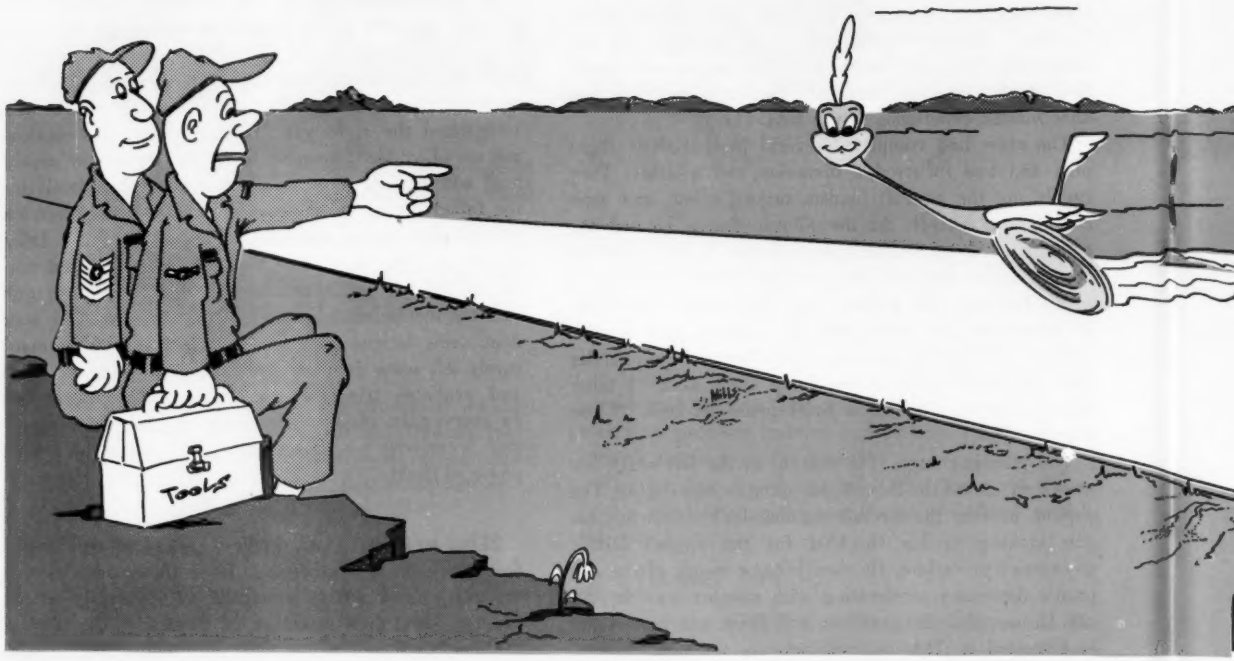
In an emergency, doing something wrong *can* be worse than doing nothing. Whatever your situation or dilemma, hurry can be an unwelcome troublemaker. Emphasize skill and cunning instead of speed, and avoid being springloaded for disaster.

General Catton, then COMAC, summed up a similar occurrence this way, "The reaction of the Apollo 12 crew, when they were struck by lightning immediately after lift-off, was a textbook example of correct emergency situation response. Their immediate indications were loss of virtually every important system on the spacecraft and that they were only seconds from complete disaster. They had the capability to abort the mission, but decided not to. Under the most difficult circumstances imaginable, they took time to carefully analyze the situation and found they were able to cope with their problems.

"Cool, deliberate evaluation of a situation, when things seem to be really coming unglued, is not easy. But it is essential. Your life and the lives of others may depend on it. No matter what your aircrew position, you must STOP and THINK."

Tom and the Birds that Di

by Maj Gene Allen
137 AESq (ANG)



SO THERE WE WAS ON this awful hot April afternoon, me and old Sarge Simpson, sittin' in the dirt off the end of the runway at Altus and soakin' up sunshine. We'd gone out there with Freddie to work on an approach light but there was more to it than we thought and Sarge sent Freddie back in the truck to get the parts and a shovel and I don't know what all . . . I was the kid on the job.

So anyway, like I said, we was just sittin' there . . . me watchin' the heat shimmers over toward the mountains and a dust devil every now and then . . . when I see this bunch of funny lookin' birds run across the road. Craziest thing I ever saw . . . necks stuck out, wings tucked up tight . . . and runnin' like mad.

"Hey, Sarge — you see that?"

"See what?" grunted Sarge from under a very beat-up cap.

"Them funny lookin' birds runnin' across the road."

"Road runners," offered Sarge. "Practically the Oklahoma state bird."

"Never saw anything like that in New Jersey," I said. "Weird. You'd think with all the sky and no smog and everything, you'd think birds would want to fly instead of running around the rocks."

Old Sarge stirred then and pushed his cap back and stared off back down the runway like he was seein' something again after a long, long time.

"Well, now, there's an interestin' story about those birds, kid. Those road runners taught me a real good lesson once."

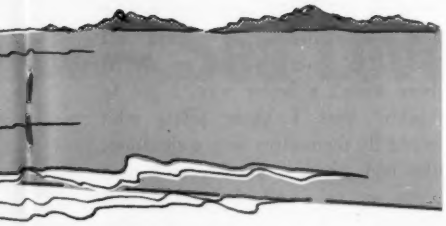
He shifted his seat and smoothed out the rocks a little and leaned back against a boulder.

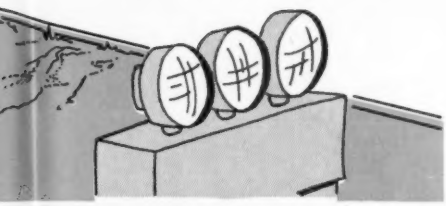
"Those birds didn't always run around the rocks like that. Fact is, the first time I saw 'em they flew just like any other bird. There was an air base here then, too . . . it was back in 1942 as I recall . . . only there weren't any Air Force but a bunch of soldiers called the Army Air Corps. And there weren't any C-5s or any jets at all. Just a flight line full of twin-engine prop bombers.

"Over there by the flight line there was a big, old barn of a hangar, made out of wood and tar paper. They was in a hurry when they put up that hangar, I can tell you. The wind'd blow and those old wooden rafters'd creak and you'd think the

Didn't Fly

Honorable Mention Winner 1972 Writing Contest





thing was gonna pitch right down on your head.

"But that wasn't the biggest problem. Biggest problem was the dern birds. Soon as they got the roof on that old hangar the birds moved in and the word got around this part of Oklahoma that the Altus hangar was some kind of bird heaven. They came flockin' in by the hundreds.

"Well, you can imagine the problems. Feathers and egg shells were the least of it, and it got so the troops would rather work out in the rain than take their chances with those birds. Ol' Lonesome George Gobel was here then as an instructor pilot and I swear that's where he got his favorite expression: 'I'll be a dirty bird.'

"The Army tried shootin' 'em, but it seemed that for every bird they got, two more flew in, until the whole thing was completely out of hand.

"That was when Tom showed up. Tom was just about the biggest, toughest tomcat I'd ever seen. I don't know what he lived on before the Army got out here but he was around when the first engineers showed up and he stayed. He was ghostly gray, lean and hard, and he had a long, long tail even by tomcat standards.

"All we knew about Tom was that after the construction crews left, he took up with fire-and-crash and slept on top of one of the trucks, kinda wrapped around the red light. And if a call came while he was asleep, he just stayed on and rode back the same way. Tom didn't shake easy.

"He strolled into the hangar one day when the place was just crawling with birds and stood there in the middle of the floor and sniffed. First thing you knew the birds stopped chatterin' and they stopped flyin' around and they all found a place to perch and just sat there lookin' down at Tom.

"Well, he licked his chops and then got up and walked over to a wooden ladder that led right to the rafters of that old hangar and he climbed all the way to the top. We couldn't see what happened but there was an awful racket, a handful of feathers came floating down, and the entire bird population of that hangar went flyin' right out the door.

"That went on for several days, with Tom comin' over three-four times a day, climbin' up to the rafters and the birds zoomin' out the door. Of course, they always came back. But it was comin' on winter and it got so those birds didn't want to go out in the cold. After awhile they learnt that all they had to do was hop off the rafters and fly around below in circles while Tom watched helplessly.

"Well, the troops saw how frustrated this made the tomcat, and being pretty sharp A and Es they decided to give Tom some help. They got some wire and fabric and dope, made a few calculations and — you wouldn't believe it, but they made Tom a set of wings. Of course, teachin' a cat to fly wasn't easy, but they started out slowly, droppin' him from a couple of feet and gradually increasin' the distance 'til he got the hang of it. Pretty soon, he was glidin' real nice and by whippin' that long tail around he could bank and turn, too. Touchdowns were a little hard at first, but he always landed on his feet!

"One day a couple of the boys hauled him up to the top of the hangar and turned him loose on a beam. Of course, the birds took off as soon as they saw him and started circlin' around the hangar like always. Tom crept out to the middle of a big beam and just crouched there until the whole flock made a pass right under him and then he jumped off.

"When he went through those birds, feet pulled up, in a 45-degree dive, you never heard such a racket or saw so many feathers in all your life, and every last one of them birds went out through a broken window even though it was mid-January.

"Tom was the base hero then, o'course. The guys made an awful fuss over him . . . painted little white stars on his wings, like the bombers, and had the information

office come over and take his picture for *Stars and Stripes.*

"The birds didn't come back for about a week, but they did come back — a few at first and then more. And everybody in that hangar knew this would be a long, hard fight to the death. It was them birds . . . or Tom. And Tom was a hero. He knew it and he had to win. Heroes don't lose, you know.

"So it started and it went on day after day. Tom climbin' up to the top, the birds scatterin', Tom leapin' bird, followed by a quick flare out and a fast landin'.

"To defend against this, the birds took to flyin' lower and lower, forcin' Tom to hold his dive longer and longer, cuttin' his margin for error. But like the hero he was, Tom didn't flinch. He pressed the attack. One day he pulled enough Gs to crack a wing spar but the guys in maintenance fixed him up and he didn't slow down a bit.

"Whether Tom woulda learned a new tactic to counter the low flying

off, turnin', divin', then levelin' off at the hangar floor. Sometimes he got his bird . . . sometimes he didn't. But he always went back up. One day two propeller mechanics swore they saw him average a flight every fifteen minutes for four hours. He learned new maneuvers as the birds grew more desperate. I myself saw him do two snap rolls in a row late one February afternoon.

"But the one maneuver that worked best was the steep dive right down on top of some unsuspectin' birds, we'll never know 'cause one day the birds pulled the ultimate trick. Spottin' Tom crouched on a beam, high above, the flock swooped down to the floor, stuck out their necks, and started runnin' for the door. Tom, his eyes fixed on the fleein' birds, didn't hesitate. He jumped off, held his dive like the tiger he was, and crashed head first into the concrete floor.

"The services was impressive, a'course, and in a way Tom didn't die in vain because the birds never came back. They never flew again either, 'cause Tom had taught them that it was just as good to run around on the ground as long as you could get enough to eat and stay alive.

"What we all saw was that those birds learned from their problems and adapted to meet a changing situation. But, that tomcat tried to win by pushin' his old technique harder and harder instead of backin' off and takin' another look to see if there wasn't a better way. I got to thinkin' that I knew pilots who would fly themselves into a situation, like bad weather maybe, and then press on usin' all their skill and countin' on it to get them out alive, instead of doing a 180 and thinkin' it over. And I found myself one day tryin' to fix a little mechanical problem that looked real easy. It was one I hadn't met before though, and I ended up with more trouble than I started with. A peek at the service manual would've licked the problem and saved me a few bucks and a set of skinned knuckles to boot."

"Anyway, that's what I remember every time I see a flock of those road runners — believe it or not."

On the way back in, Sarge was stretched out in the back and I asked Freddie what he thought about all that.

"Sounds about right to me, kid," he said, "sounds about right."

"Aw, come on, Freddie," I protested. "You know it ain't so."

"Oh, sure," he smiled. "But I know lots of things that ain't so. That don't mean you can't learn somethin' from 'em."

Another road runner jumped right out in front of the truck just then, and Freddie gave him a couple honks on the horn. The bird took a big jump but saw he wasn't going to make it on foot, so he flapped his wings kinda awkward, flew a few feet, then dropped down and started runnin' again. I watched him out of the back window till he was lost in our cloud of dust.

Wake Island
— Sea Level Air Base on a Volcano

by John B. Leslie, II
Facilities Management Corp

When the telephone rang and the youthful officer picked up the receiver, the caller inquired, "Who is your harbor master?" Sounds like a simple question, right? Under other circumstances it might be, but the man who answered that phone was Air Force Lt Col Gordon Pink, Commander, Detachment 2, 61st Military Airlift Support Wing, Wake Island. His answer to the question was, "**Who** is my **what**?"

A simple question like that can shatter an otherwise quiet afternoon, especially when you don't know who your harbor master is or, in fact, if you're not really sure you have a harbor. Could a mooring bouy off the reef and a small channel leading to a rather small dock be a harbor? If so, then we have a harbor — and it would follow that a harbor master might be in order.

This is only one of the rather unusual problems faced by Lt Col Pink every day since June 24, 1972. On that date the Air Force became the official host and assumed responsibilities of Wake Island management from the Federal Aviation Administration, and Wake Island Air Force Base came into being.

Our newest air force base is unique in several ways. The Military Airlift Command was specified as host for the Air Force, and Wake is one of only three overseas bases under MAC ownership (Ramey

Photos by John Leslie

LEFT: A C-141 arrives at Wake. ABOVE: Sunset finds an oil tanker moored offshore, almost directly under the approach zone. RIGHT: The man charged with keeping it all together, Lt Col Gordon Pink.

Wake Island

and Lajes are the other two). The parent organization of Det 2 is the 61st Military Airlift Support Wing at Hickam AFB, Hawaii, under the command of Colonel Robert H. Campbell, which supports MAC throughout the Pacific. Wake also claims the honor of being the only Air Force base to have its own federal bird sanctuary. (Incidentally, an astute pilot will immediately associate "bird sanctuary" with "bird hazard," and will be ready.)

For those who have never visited "Wonderful Wake," it is a coral atoll located at 19 degrees, 18 minutes north and 166 degrees, 36 minutes east. The atoll is part of the rim of an old volcano, with the former crater forming the lagoon. There are three islands—Wake, Peale, and Wilkes—named for key people in the atoll's history. Total land area is two and a half square miles. Since the island is west of 180 degrees, the International Date Line, the day starts here for all America.

Climate is delightful most of the time — the temperature hovers close to the average of 80 degrees and there are gentle prevailing winds from the northeast. However, two devastating typhoons have battered the islands, one in 1952 and another on the same date in 1967. Even tropical disturbances can cause troubles, because it doesn't take much crosswind to make operating from the single runway pretty sporty.

The islands were discovered in 1568 by Spanish explorer Alvaro de Mendana, who named the atoll "San Francisco." Then in 1796 they were rediscovered by Captain William Wake, and in 1840 explored by U.S. Navy Commodore Charles Wilkes and naturalist Titian Peale. The U.S. took possession on January 17, 1899 (about the time that Hawaii and Guam joined the fold), and in 1934 the Navy assumed jurisdiction. Pan American Airways built a seaplane base on Peale, and the first clipper landed on August 9, 1935.

The year 1941 was one of the most turbulent for the islands. In January, an advance Navy detachment arrived to establish a naval air base, and the roar of construction equipment interrupted the calm of the Pacific. On December 4 a marine squadron of F4Fs arrived from the USS Enterprise, and four days later the first Japanese air attack began. On December 23, after a valiant 15-day fight by marines, sailors, and civilian construction workers, the Japanese took possession and they held Wake until September 4, 1945, when Japan's Rear Admiral Sahaiban surrendered to Brig Gen Sanderson, USMC. (Incidentally, the admiral whose task force took Wake in 1941 called it Bird Island or "Otari Shima.")

In 1947 the Navy designated Civil Aeronautic Administration (CAA), later FAA, to exercise the Navy's jurisdictional responsibility. October 15, 1950, saw President Truman and General MacArthur meet for their historic conference. And on Saturday, June 24, 1972, at 1600 local time, Mr. Allan Andrews, Wake Island Area Manager for the Federal Aviation Administration, handed over the

ABOVE: FAA still operates the Wake Control Tower. RIGHT: Wake Island, lying 2,300 miles west of Honolulu, has a 9,800 foot runway. A parallel taxiway has been added since this photo was taken.

management of Wake Island to Lt Col Gordon Pink, new Commander, Wake Island Air Force Base.

Although Wake is an air base, the USAF presence is a small part of the island's staff. In addition to the Air Force contingent of approximately 30 personnel, FAA has employees operating the control tower and radio equipment for both navigation and communications needs, plus operating the Fire Department. The U.S. Coast Guard has a seven-man unit on Peale Island, under Lt Ted Musselman, to maintain and operate the loran station used for long distance navigation.

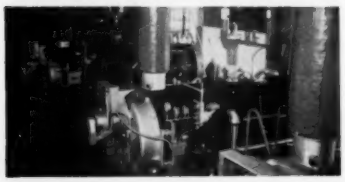
Most of the island residents are employees of Facilities Management Corporation (FMC), a division of Automation Industries. Under contract to the Air Force, FMC operates the aircraft services, operations, and traffic functions, providing all normal services required for servicing aircraft at this en route station. In addition, FMC also provides all the support services, such as billeting, messing, in-flight service, required on any Air Force base. FMC also handles the engineering, roads and grounds repair, in addition to operating and maintaining a power plant consisting of six huge diesel engine generators. Normal operations is four units running at 80 percent capacity, producing 2,500 KW per hour, with the capability of providing emergency back-up power for all the island's critical functions. Remember the call concerning the harbor master? It came via Wake's own automatic dial telephone system, which includes both business and residential users. (Speaking of harbors, the supply ships anchor just off the approach end of runway 10, and the masts stick up into the approach zone. You might watch for this the next time you fly into Wake.)

One of the more interesting functions on this bit of land in the midst of millions of square miles of ocean is the water works. Wake Island Air Force Base has a water distillation plant capable of producing 150,000 gallons a day of fresh drinking water. The plant processes salt water or brackish water from wells on the island, plus rain water caught by two large, paved water catchments. Wake Island has a total water storage capability of five million gallons. The distillation process is interesting in that the water is boiled in a vacuum to control mineral and calcium deposits. (Can't you see it now on TV's "What's My Line?" The contestant answers, "I'm a still operator at Wake Island Air Force Base, and it's not only legal but vital to the survivability of some 1,000 island residents.")

There are dozens of additional functions; all go together to form a complete aviation community providing all transiting fliers, military and civilian, with the best possible services. Our primary mission is to support MAC aircraft — whether it involves fuel, crew bunks, radio facilities, or even a harbor master's services.

ABOUT THE AUTHOR

Mr. Leslie hails from Fort Wayne, Indiana. He majored in commercial art during his school days in Chicago and worked in stage craft for five years. During the Korean War, he served as an Army supply specialist. In 1956 he turned to aviation, earning his FAA certificate as an aircraft dispatcher.



A Wake Island photo album. Clockwise, from lower left: Fresh water begins with steam from these boilers; 300,000 gallon tanks store water in the middle of the ocean; the billeting office is crew-rest crossroads; palm trees guard Air Force quarters; and the base landing craft chugs into the "harbor."

Like Diogenes, Don Quixote, and Richard the Lion Hearted, Capt Beson tunes in on a very different drummer.

They Aren't Easy to Find

by Capt Gary Beson, 437 MAWg

Artwork by Capt B. T. Adubato

A FEW MONTHS AGO, I had the privilege of being on a crew with one of those grizzled old flight engineers who was obviously a veteran of many an 0230 alert. I'm sure that you all recognize the type. His greasy hangup bag has embroidered on it a funny looking airplane with four strange spinning mechanisms attached to its straight wings. He knows the C-141 and its system better than he knows the streets in on-base housing. He also knows that manual lean is not an emaciated Latin and that the real Martinique is located in Midwest City and not somewhere in the Caribbean.

In any case, this particular MAC veteran revealed during the course of our trip that he was soon to terminate thirty years of military service. He noted that his career had been highly gratifying and that his retirement would involve a great deal of nostalgia and fond memories. He did mention, however, that his military life had not been without thorns and that there were three events he would like to witness prior to his terminating his lengthy military service. First, he would like to be given the opportunity just once to meet the "regular crew chief"; second, he would welcome the briefest glimpse of "the big picture"; and last, he would like to know who "they" are.

It occurred to me that behind the humorous aspect of his three requests, he may very well have a point. I mulled over the three requests for the rest of the trip, and decided to dismiss the first two as impossible goals. But I got to wondering if it wouldn't be possible to identify for him the nebulous "they."

I should admit at the onset that my previous experience has indicated that "they" is not the invention or the sole possession of the military establishment. It seems as if "they" has infiltrated almost every organization, be it large or small, and occurs in direct proportion to the size of the unit. The larger the organization, the more "theys" there are. Therefore, I reasoned, in a system as large as the Military Airlift Command, there should be no difficulty in locating at least one "they" to introduce to this MAC veteran. But where to start my search?

I was assured by many aircrew members that a whole group of "theys" could be located in the airlift command post. So, I began my quest there, but my visit to ACP proved fruitless. I could find no one there but other pilots, navigators, and flight engineers, none of whom claimed to be "theys." But the duty officer was certain that there were some "theys" in the wing complex.

A diligent search of the wing revealed much the same results as my previous search of the command post. There were navigators, loadmasters, flight engineers, a raft of support personnel, but still not one "they." However, while conducting my search and listening in on many conversations, I became convinced the "theys" could be found only at the numbered air force and command levels.

At last I had something to go on: "theys" always occur at least one level above that in which you're searching. However, this notion was soon proved incorrect. A quick inquiry to the numbered air force indicated that the real "theys" could be found not only at MAC headquarters but also some "theys" were known to be hiding in the various wings and even lower levels.

My search was now becoming so desperate and confused that I was willing to settle for a brief introduction to just one "they." But the "theys" seemed to be everywhere except where I was looking.

Flight crews were convinced that the "theys" were in ACP; ACP personnel were equally sure that the "theys" were firmly entrenched somewhere between the candy machine and their swivel chairs in wing headquarters. Wing personnel lived in constant fear of the "theys" at air force and MAC levels and so on up and down the line.

By this time, I was truly frustrated by the flight engineer's challenge to produce a "they." It was then I decided that perhaps I could secretly substitute a "we" for a "they" and give him the satisfaction of having met at least one "they" prior to his retirement. Luckily, I discovered a visiting standardization type from headquarters who, as near as I could determine, approximated a "they." He reluctantly agreed to impersonate a "they" just long enough to satisfy at least one of the three original requests of the retiring MAC veteran.

The deception, however, turned into an utter failure. It seems as if the standardization type had gone through Tinker with the soon-to-be retired flight engineer and was immediately recognized as a "we." I had had it. In all of MAC not one self-confessed "they"; every "they" turned out to be "we."

Well, I don't have to be run over by a fleet service truck to get a point! Perhaps, just *perhaps* there is no "they." It is conceivable that "they" exists only in the minds of "we." Armed with my newly discovered theory, I tried to sell the idea to my friend, the flight engineer. However, after my rather shoddy attempt to fool him with a bogus "they," he was somewhat less than enthusiastic. He even started looking at me suspiciously, so I decided I had better wish him a happy retirement and try to forget the whole sordid mess.

I intended to submit my report of this little episode to THE MAC FLYER writing contest, but since I failed so miserably to locate a legitimate "they" I decided against it. Besides, they probably wouldn't recognize a good story if they heard one anyway.

(Ed. note: We not only recognize a good story, but we also admit to being a "They.")

Global Notes

hurray and thanks

The distinguished troops from 9 WRWg/OI, McClellan AFB, are the first **and only ones** to respond to our plea for nice photos. We thank you very much. And now, how about the rest of you?

galaxy thousand hour club

When Maj Monte M. Martin, 9 MASq, became one of the first men at Dover to log 1,000 hours in the C-5, he was accorded a special honor. Col Barr D. Younker, Commander 9 MASq, presented Maj Martin a citation from Lockheed Company recognizing his membership in the Galaxy 1,000-hour club. Maj Martin, who formerly served as a C-5 simulator instructor at Charleston, was praised by Col Younker for his achievement and for his exceptional knowledge of the C-5.

aero club kudos

The Federal Aviation Administration (FAA) Annual Safety Award for 1971 was recently presented to McGuire's aero club by Dick Washburn, FAA Accident Prevention Specialist.

The FAA awards are made to select military aero clubs for exercising skill and judgment in accident-free operation of their aircraft during each calendar year. This is the sixth award to the McGuire club since 1964. Col Paul Echabarne, Base Commander, received the award on behalf of the aero club. He congratulated the club members on their hard work and diligence.

mr. fixit is man of year

SSgt James M. Pires, 436th Field Maintenance Squadron, Dover AFB, is Man of the Year for 21st Air Force, and his name has been submitted to the MAC competition. An outstanding NCO, Sgt Pires supervises and performs maintenance on aircraft flight control, landing gear, and cargo door systems. Because of his ability to diagnose problems quickly and accurately, he has often been dispatched on special trouble-shooting missions. No matter how demanding the job, he meets the challenge and proves to be the man to rely on when a difficult problem arises.

yates award

Capt Edgar A. Gideons, 55 Wea Recon Sq, McClellan AFB, won the Yates Award for 1971. It is presented annually to the outstanding aircrew member in Air Weather Service. His duties as a weather officer have included flying into the eyes of hurricanes, participating in cloud-seeding programs during droughts, and working on winter storm forecasting on the east coast.

award winners

Two MAC men earned Outstanding Individual Safety Awards in September.

Maj Walter R. Blackwell, 1550 FTSq, was recognized for successfully autorotating a TH-1F helicopter to a smooth landing following a major engine malfunction. The aircraft had a severe power loss while the student was about to initiate a practice forced landing. Maj Blackwell quickly analyzed the situation, took the controls, stabilized the autorotation, turned into the wind, flared the helicopter and touched down gently on the unprepared flat area, only seconds after the power loss.

Airman Gary E. Timms, 1550 FMSq, was cited for his quick thinking and deliberate actions which prevented a fire or explosion on his AGE tractor and averted possible damage to nearby aircraft. As he was towing power units near parked aircraft, he noticed the tractor cab filling with smoke. Checking quickly, he found a short in the tractor wiring under the fuel tank. He then drove a safe distance away from the aircraft and stopped to pull the fuses.

C. R. TERROR

Ib you dink flyen wib a cood is dangerous — ty wribin wib one.

IT WAS THANKSGIVING DAY, and Long Suffering Sam, copilot extraordinaire, was deep in his predinner snooze. The hearty aroma of roasting turkey laced with onion and sage seeped into his brain, turning his dreams to the culinary extravaganza which lay ahead. Then the visions of the groaning board vanished as the bing-bong of the doorbell tugged him back to consciousness. While his older girl, Roberta, answered the door, he shook off the fog and pulled himself to his feet.

"Daddy," called Roberta, "it's Major Terror. He's here."

"Come on in, chief, and make yourself comfortable," greeted Sam from the middle of a tremendous yawn. "Got just enough time to mix a terror-tini before the game starts, and Mabel will have the bird ready as soon as the gun sounds for half time. Now, do you want a single or a double?"

"Sabby, old socg, bedder mage thiz onde a driple," coughed C. R.

"Hey, boss, you sound rotten," opined Sam.

"Yub — ad you diddn miss a thig by goig on leabe. Thad las' trib was rodden."

"Good thing you got your flu shot, eh?" teased Sam.

"Shuddub ad gibbe a mardini," C. R. ordered.

"Coming right up," Sam chirped. "Phyllis, get me some more ice, please — your momma will be a lot happier if I don't go near the kitchen."

"Aw, Daddy, why do I always have to do everything?" complained the smaller of Sam's two girls.

"Move!" commanded Sam, starting to roll a newspaper.

As Phyllis vanished around the corner, C. R. nodded with satisfaction — maybe after all these years Sam would learn how to be an AC. Then he slid his bulk into Sam's big easy chair, pulled a lap robe over his paunch, and shivered his way into a comfortable position.

"Hey, wait a minute!" shot Sam. "Where's Blinky? He was going to ride over with you, wasn't he?"

"Yez" replied C. R. "—and he rode wid be all the way do the hosbidal. The doc took one loog ad hib ad pud hib in bed. He's worze thad I ab."

"And I suppose there's a story behind this?"

"Yub. I'll dell you all as sood as I ged thad mardini."

Sam performed the time-tested ritual with a definite flair, sliding the potables ever so gently down the side of the pitcher and mixing the brew with two twirls of the rod. Then he poured an ample beaker for C. R., allowed himself a healthy portion, and flopped expectantly in an easy chair beside the Runny-Nosed Rajah.

"Wudderful sauze, Sabby, wudderful," the Gasping Glass Grasper enthused as he drained his drink and kissed his fingertips with a bit of the Terror flair. "Pud a head on thad and we'll get down to biznez."

Sam reached across to the pitcher, decanted another four ounces, and set the almost empty vessel on the table again. "Okay, boss, shoot," he suggested.

"Sabby, I thig the way I feel I'd bedder led you read my rebord." He paused to rummage in the rumpled interior of his mauve velvet smoking jacket, found what he was looking for, and thrust the well-wrinkled sheet across to his host. "Ear ya go," he wheezed, then took another healthy belt.

As Sam unfolded and smoothed the sheet, he recognized the strangely archaic penmanship as that of his leader and the paper as a piece of one of Blinky's loran charts. The first of C. R.'s comments were routine. It began like a standard mission — home station to onload, then to Hickam, Clark, offload station and Yokota.

Sam paused to glance at his leader, who had just drained the last of the pitcher and was peering longingly at the bevy of cheerleaders prancing across the TV screen. Then he cleared his throat and began to read aloud.

" 'Everything was ops normal until we got to Yokota. After 12 hours on the ground we got a call from ACP that our mission was being diverted to Eielson to pick up a special high priority load bound for Midway. So much for the 24-hour ground time we'd been promised. However, I was able to find the crew and get airborne in three and a half hours.

" 'At Eielson, the predicted clear and a million turned out to be the exact opposite — everything north of Elmendorf was zero-zero in a blizzard whiteout, with winds close to 60 knots. We turned south and were almost in the pattern at Elmendorf when ACP called — Eielson was again clear and quiet so would we please return? To the rear, aviate; we landed at Eielson Wednesday at 1430 local — just an hour before sunset.

" 'You won't believe this, but the traffic people said they didn't know we were coming in and they would try to get the load ready as soon as possible — "maybe by tomorrow night." We rapidly compared the shopping and night life of central Alaska to that of Tokyo, offered a few pithy comments that quickly froze in the —5 degree air, and trundled off to the club.

" 'As we were loading the bus, I had my first inkling that things just might not go right. When we left home, I had checked to see that everyone had enough cold weather gear to get us through the worst expected — Yokota and possibly Elmendorf. Some of the crew had heavy flight suits; Ty Downs and F. N. Greenbar had lightweight ones with long johns and parkas. Everyone else had a heavy flight jacket except Blinky, who said he knew where we were going and wouldn't need to haul a ton of useless clothing. He's usually right, so I let it go. But there we were in our arctic deep freeze. We had some pretty chilly people by the time we got on the crew bus.' "

Here Sam paused and glanced up. "F. N. Greenbar, again, eh? Boy, you shoulda known, after that last trip with him . . ."

"Shuddub and keeb readig," advised the Master Martini Muncher.

" 'The aircraft wasn't loaded by sunset the next day, so our departure was delayed for another 24 hours. Finally, at sunset on Friday we were alerted to head for warmer climates. Another baggage drill, then we started preflight. I've never seen so many leaks in one airplane in my life! I guess our bird had spent so much time on the sunshine runs that the 48 hours of cold soaking at temperatures down to —50 degrees had turned it into a plumber's nightmare. Max Torque, Earl Overheat, and even Ty Downs spent almost four hours tightening fittings while the rest of us tried to stay warm on the almost unheated flight deck.

" 'Eventually the troops got everything tightened up and we went back to finish the preflight. Here's where we almost lost Max. He was trying to pogo one of the tanks when his grip slipped and his hands were drenched with a couple of quarts of super-cold JP-4. His hands looked

so bad that we ran him over to the flight surgeon, who diagnosed it as borderline frostbite and ordered him not to leave the warm flight deck for the remainder of the cold part of the mission. After this latest delay Blinky was shaking like a leaf so we wrapped him in a couple of blankets and had Max start fixing hot soup, hoping to keep them both warm.

" 'I had had about all the delay I could stand, and the threat of another aircraft landing and making ice fog convinced me to get the show on the road. After a couple of trips around the plane kicking a few backsides we got everything tied down and buttoned up. Then we started the engines and began getting some heat on. Boy, that heat felt good — I had gotten sweaty before I got in the seat, and now I was starting to cool off and needed some extra warmth.

" 'We got airborne just before midnight and headed south. The temperature gages for the cockpit and cabin were climbing almost as fast as the altimeter. We soon had the flight deck at almost 75 degrees and the cabin at 65 — and even with all our clothes, that felt mighty nice. In fact, the heat plus the fatigue from the cold made me drowsy. I turned the controls over to Greenbar and went back to the hayloft to catch a nap.

" 'I woke up about an hour later, even colder than I had been on the ground, and knew the cabin heat had failed. I was just about to go beat on a loadmaster when Blinky stuck his head through the hatch and told me I'd better get up before I caught cold. Then he told me what had happened. It seems the blizzard had packed our cargo full of snow, and as soon as we got the cabin temperature up, the floor had turned into a lake. Water was sluicing aft when Ty realized what had happened and ran to cut off the heat. The only problem was that he slipped on the slick floor and fell flat, getting soaked from head to foot with ice water. Blinky moved him to the cockpit, got him into dry civvies, and started pumping him with hot soup.

" 'By this time I was starting to shiver violently, so we got the cockpit as warm as we dared, and droned on toward Midway.

" 'During letdown, I had Greenbar punch off the autopilot and do some hand flying. He was smooth as silk — and I was beginning to hurt all over, so I decided to let him have the landing. Then bad news struck— the second engineer was making his descent check of the hydraulic reservoirs and was peeking through the port hole just as a return line to the number two system reservoir came apart and hydraulic fluid flew all over.

" 'Immediately the cockpit was a mess of caution lights and flailing hands as we tried to resolve the emergency. I soon realized that number two system was gone and with it our hydraulic flight controls. I was sure glad I'd read that article about autopilot approaches, 'cause George was about all that was left. I took over from Greenbar, had him tell Midway of our troubles, and eased Old Droopy down and around the GCA pattern.

" 'I selected control wheel steering so that I could drive while the autopilot did the work, and things were going great until just before roundout. We hit a gentle wind shift and I rolled in some bank just as a violent sneezing fit hit me. I hollered "you got it," grabbed for my handkerchief, and then watched dumbfounded as we continued to turn to the left. I grabbed the controls with my free hand just as the number one engine bounced off the sand, rolled us level, and managed to get the bird to the runway.

" 'When we got stopped I asked Greenbar why he hadn't rolled us out before we hit, and he said the controls wouldn't work. About then Max reminded me that control wheel steering works only on the pilot's side, and Greenbar muttered that they never told him *that* at Altus.

" 'We checked everything real carefully after we got the cargo off. Number one only had a few scrape marks and we decided to bring it home that way. My head was still clear enough for one more leg direct to home station.

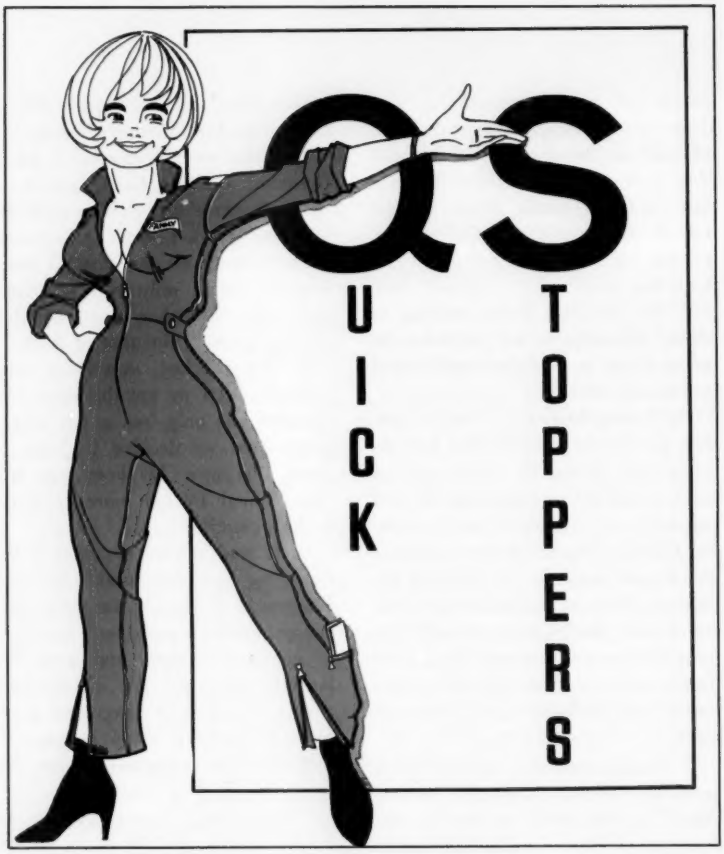
" 'It wasn't until we started letdown for here that Blinky, Ty, and I began to feel really bad. And that engine finally banged out a couple of compressor stalls and quit. We landed okay, and the maintenance troops immediately diagnosed it as FOD and sent a sharp message to Midway. We promptly headed for crew rest. End of mission."

"Wow, chief, I guess you win the rotten mission of the year award. Did you find out why the hydraulic line failed?"

"Yub," C. R. replied. "I thig the troobs got a liddle agzious as they were tidenig ub the lides ad craged the nud." Then raising his glass, he asked, " 'Ow 'boud figzig a liddle more of Dogdor Sam's code rebedy?"

"Coming right up," agreed Sam, moving back to the liquor locker. He paused, bottle in hand, and asked C. R., "By the way, what was that high priority cargo that caused so much trouble?"

"You'll neber beliebe id, Sab — the eddire load was pordable fogs 'ole diggers thad the Dew Arby wanded do leabe at Midway for a year for corrosiod desding. Ad I know what elze they cad do wid deb . . ."

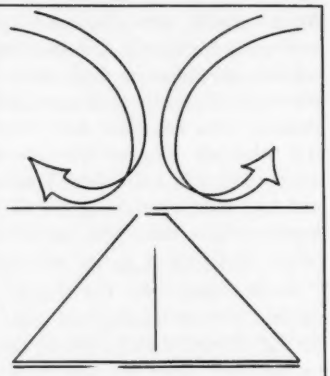


Shed a Little Light

The many-motor pilot reduced power and began descent. Then, as he neared his assigned altitude and began to level off, he was unable to increase power on number three engine. The pilot elected to shut the engine down and subsequently made an uneventful three-engined landing.

Investigators found that an eyebrow light had fallen out of the overhead panel and lodged in the throttle quadrant, jamming the number three throttle. During descent, the aircraft had passed through some turbulence, and the wrong-size bulb must have fallen into the quadrant. Foreign objects are often familiar objects in foreign places, and how they get there is sneaky and insidious. Although an ultra clean cockpit wouldn't have prevented this incident, doing the bulb replacement job right the first time *would* have.

Old Song, New Singers



Two military aircraft — both on an IFR clearance, both in VMC conditions, and both landing at the same base — just about bought the farm. The problem: each one was being controlled by a different agency. One airplane was being vectored to a visual landing by FAA while the other aircraft was in the GCA pattern under a military controller.

The hang-up appeared to be in the coordination between the FAA and military controllers. The FAA controller considered the GCA traffic to be VFR because the pilot was accomplishing consecutive approaches. Therefore, the FAA controller did not provide adequate IFR separation for the aircraft he was vectoring to the traffic pattern — so we had another near miss and a couple of irate pilots.

The local FAA and AFCS types have changed their coordination procedures to alleviate future problems. In *their* area, you'll be safe. But in others, your eyeballs will make the difference — and we can't say where.

Fable-ous Loss

Remember the old nail-shoe-horse-kingdom bit? Think it was fantasy? Consider this C-5 tale — a *very true tale*. The aircraft arrived at an en route stop and postflight inspection revealed that numbers one and two engines had foreign object damage. Corrective action: remove and replace. Manhours involved: 180. Cost: $495 (horse size). But was the cost *really* $495? You bet your boots it wasn't. The replacement cost of a basic C-5 engine is $850,000, while a completely built-up engine costs $2,500,000. Now multiply those figures by two for this incident (kingdom size!)

The cause? Two one-penny rivets (small nail size) that someone left behind after some sheet metal repair.

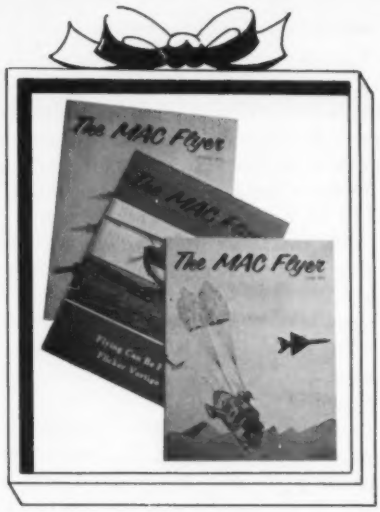
Icy Bottom Buckles

Have you read our C. R. Terror yarn for this month? If so, you'll recognize an episode similar to this one, which happened to someone else *before* it hit the Gross Gripper himself. Here's the story.

A C-141 was picking up cargo at a series of bases and was loading at its last stop before the long over-water leap to the states. The last few pallets to go on board had been stored out in the winter weather and were well larded with snow. The loading crew, trying to be helpful while still trying to avoid a traffic delay, quickly brushed off all the snow they could, then rolled the pallets into the bird and buttoned things up.

As the cargo warmed up during flight, the snow which was packed inside the cargo melted and the water ran back to the ramp hinge area, where it refroze (the ramp drain holes were clogged with safety wire, wood chips, and lint). When the ramp was lowered after landing, the bottom of the cargo ramp buckled, necessitating 146 manhours of repair work.

The cure? If your drains are plugged, the choice is either snow-free cargo or subfreezing cargo compartments. Well, at least you read it second in C. R.



Help put me under a tree. Give The MAC Flyer for Christmas.

Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

Please send THE MAC FLYER, MAC RP 127-5, for one year to:

Name _____
(Please print)

Address _____

_____

( ) $2.00 for mailing to domestic or APO address.

( ) $2.50 for mailing to foreign address.

(Make check or money order payable to: Superintendent of Documents.)

Mental Math for Crosswinds

You are cleared to land on Runway 31 at Scott. The weather is clear. The runway surface is dry. But there's a 35-knot wind reported from 355 degrees. Your maximum allowable crosswind component is 26 knots. Are you legal?

In many cockpits this question is generally followed by a scene of gyrating crewmen plunging into the frustration of unearthing their wind component chart. Which manual? What section? What page? Are those winds magnetic or true? Find the intersection of wind angle and velocity. Follow the line down. Oops, is that the one? Let me retrace it . . .

Sound familiar?

One airline captain offers a "quickie" guide to reduce this rain dance and to recheck the figure someone pulls out of the chart. A crosswind component is calculated by multiplying the wind component velocity by the sine of the angle between runway and wind heading. With this in mind, the captain has memorized the sine of angles 30 degrees, 45 degrees, and 60 degrees (i.e., .5, .7, and .9 respectively). He can then make a rapid calculation of his crosswind component using his given wind and the sine of the angle closest to the actual wind angle. If the wind angle varies somewhat from his representative angles of 30 degrees, 45 degrees, and 60 degrees, he can make a reasonably accurate mental interpolation.

Using our hypothetical case at Scott, the wind angle is 45 degrees. The sine of 45 degrees is .7. The wind velocity of 35 knots multiplied by .7 computes to a 24.5-knot crosswind component. Thus, in this situation you would be legal.

Let's suppose the wind shifted to 010 degrees; same velocity. This makes a 60 degree wind angle, the sine of which is .9. The wind velocity of 35 knots multiplied by .9 computes to 31.5, and so in this situation you would not be legal.

This principle can be used in quickie tailwind/headwind component computations, too, except that you would use the cosine of the three angles. Since the cosines for these angles are the reverse of the sines, they're easy to remember.

Given:

Wind Angle	*Sine*	*Cosine*
30 degrees	.5	.9
45 degrees	.7	.7
60 degrees	.9	.5

Formula:

Wind Angle Sine x Wind Velocity = Crosswind

Wind Angle Cosine x Wind Velocity = Tailwind/Headwind

And a reminder: anytime you call approach control, tower, or metro for local winds at the station where these facilities are located, you will receive magnetic winds. Other winds, including forecast winds on your 175-1, are true.

(*Flight Safety Foundation*)

Takeoff Slide to Disaster

Remember the MAC commercial contract flight that took off with locked brakes and crashed off the end of the runway at Anchorage? Do you remember the KC-135 incident at Eielson where the crew took off with the brakes locked, but were lucky enough to get airborne and return for a safe landing? In both situations the runway was very slippery, and the crews taxied into position and set the parking brakes as they held for release. For some reason, the parking brakes were still engaged as the aircraft started takeoff roll.

The first step toward preventing a situation like this from happening this winter is to recognize that it *can* happen.

Consider this example. The RCR is about 06 as you taxi onto the runway for takeoff. Then tower advises you to expect a five minute ARTC delay: unusual, perhaps, but it could happen. You set the parking brakes and wait. Soon the clearance comes through. Your copilot is making the takeoff from the right seat; he advances the power as you start to release the parking brakes. As the power comes up, the aircraft starts to slip forward smoothly. *You* think *he's* released the brakes from the right seat — *he* thinks *you've* released the brakes from your side. Neither of you has released them and the stage is set for a long slide down the runway. It's possible.

One solution might be to decide during your before takeoff briefing who's got the brakes. You've got to make sure the brakes are off before takeoff, especially when the RCR is low.

after deadline . . . .

TIP DRAGGER -- Whether you're fighting low ceilings or tricky winds, the end result can be some sudden yoke and rudder work at very low level. Caution: There is an increased possibility of dragging a wingtip when trying to make a major aircraft realignment close to the ground. Case in point: One of our fine lads driving a C-141 was forced to make a missed approach due to low visibility in fog. The crew proceeded to the hold-and-talk-it-over point, then returned to try again. During approach number three, flown by the copilot, the pilot finally saw the ground, assumed control from his right seater, and made a "slight" course correction. A firm touchdown and fine taxi-in followed. At shutdown, the crew was surprised to see maintenance men were clustering around to examine the dinged wingtip.

TELL IT, BROTHER -- Suppose something unusual -- perhaps "self-induced" unusual -- happens in flight. Your best plan is to tell one of your ops supervisors how you got into the dilemma. The next plan is to sidle up to a fly safe type and whisper in his ear. If your embarrassment is acute, check AFR 127-6 and submit an anonymous hazard report. But do tell someone -- somehow.

Case one: a problem concerning C-5 inadvertent and premature flap retraction just came to light though the hazard has long existed. Seems the crosswind reset switch and flap handles are close together, and both can be operated by an upward hand movement. An over-quick copilot finally put the pieces together, but no one passed the word to the ops folks. The fly safe folks heard about it only through bar talk.

Case two: when C-141s were being plagued with a rash of in-flight reversing troubles, crewmen were reluctant to admit a possible foul-up but knew serious trouble could be lurking. So, a series of anonymous hazard reports appeared -- and in short order a fix was developed. Real pros get the hazards reported.

COMING ATTRACTIONS -- The December issue will offer a year-end message from Gen Carlton, a report on microwave landing systems, a helicopter icing feature, a helping of seasonal fiction, and a look at C. R.'s woes as an LBR Detco.

☆ U. S. GOVERNMENT PRINTING OFFICE: 1966 O-423-6